2012 Decompression Sickness Risk Standing Review Panel
Status Review for:
The Risk of Decompression Sickness

Comments to the Human Research Program, Chief Scientist

2012 Decompression Sickness Risk Status Standing Review Panel (SRP) WebEx/teleconference Participants:

SRP Members:
Captain Richard Mahon, M.D. - Naval Medical Research Center
Stephen McGuire, M.D. – United States Air Force School of Aerospace Medicine

NASA Johnson Space Center (JSC):
David Baumann
Johnny Conkin, Ph.D.
Ronita Cromwell, Ph.D.
Michael Gernhardt, Ph.D.
Jason Norcross
Peter Norsk, M.D.
Steven Platts, Ph.D.
LaRona Smith, Ph.D.
Susan Steinberg, Ph.D.
Lisa Stephenson
Mariah Thompson, Ph.D.
Diane Younker, Ph.D.

NASA Headquarters (HQ):
Bruce Hather, Ph.D.

NASA Research and Education Support Services (NRESS):
Tiffin Ross-Shepard

On October 29, 2012, the Decompression Sickness (DCS) Risk SRP, participants from JSC, HQ, and NRESS participated in a WebEx/teleconference. The purpose of the call (as stated in the Statement of Task) was to allow the SRP members to:

1. Receive an update by the Human Research Program (HRP) Science Management Office (SMO) on the status of NASA's current and future exploration plans and the impact these will have on the HRP.

2. Receive an update on changes within HRP (for example, movement of the IRP online, gap rewriting, etc.).

3. Receive a brief update by the Element or Project Scientist on progress since the 2010 SRP, as well as discuss the response to the 2010 Chair +1 SRP meeting.

4. Participate in a discussion with SMO and the Element regarding possible topics to be addressed at the face-to-face 2012 SRP meeting.

Based on the presentations and the discussion during the WebEx/teleconference, the SRP would like to relay the following information to Dr. Kundrot, the HRP Chief Scientist (Acting).

1. The SRP thinks that overall the DCS group should be commended for their work and accomplishments since the SRP met in January 2012. Also, the SRP found the group highly responsive to previous recommendations.

2. Specifically with regards to progress of previously identified gaps:

DCS 1

- The DCS group should be commended in defining the "acceptable" risk of decompression for study and operational purposes. This is evidenced by the updates to NASA-STD-3001 4.4.3.6,4.4.3.6.1, 4.4.3.6.2, 4.4.3.6.3, 4.4.3.6.4

DCS 2

- As the DCS group is doing; standardized ambulation profiles for studying risk of DCS will allow easier translation/transition to operational environments. Nucleation mechanisms will likely have a large impact on DCS risk.

DCS 3

- Characterization of EVA atmosphere in combined effort to minimize oxygen prebreathing (OPB) resources the 8.2/34% atmosphere has been presented to the relevant stakeholders. Recognition and plans for studying the 8.2 pressure excursion to 4.3 psi are being implemented. The concept of chronic/sub-acute effects of 8.2 34% atmosphere are recognized by the DCS group and need to be further supported.

DCS 4

- Models being explored and validated both on risk of DCS, as well as treatment. A directed task synopsis has been submitted.

DCS 5

- The HRP will not fund research on Exploration Atmospheres (Prebreathe Validation and Flight Demonstration) until direction from NASA Headquarters is provided.

DCS 6

- Addressed by routine meeting attendance, as well as research reviews.

DCS 7

- Treatment models/ algorithms also being considered in current research DCS if institutional review board approval can be obtained and subjects not at increased risk.

Potential New Consideration:

- Abnormalities in central nervous system imaging using magnetic resonance imaging; specifically diffusion tensor imaging fractional anisotropy (DTI-FA) appear to be present in some pilots at risk for DCS. This imaging should be incorporated (in at least a small group) of current test subjects.